Amendments of the Claims:

A detailed listing of all claims in the application is presented below. This listing of claims will replace all prior versions, and listings, of claims in the application. All claims being currently amended are submitted with markings to indicate the changes that have been made relative to immediate prior version of the claims. The changes in any amended claim are being shown by strikethrough (for deleted matter) or underlined (for added matter).

1. (Currently Amended) A semiconductor laser comprising:

a) a bottom reflector;

b) a top reflector; ~~and~~

c) a cavity located between the bottom reflector and the top reflector; and~~comprising~~

d) an active region ~~located within the cavity~~ that can emit light;

wherein the semiconductor laser can be operated in at least one resonant optical mode, ~~wherein the cavity and the active region are designed~~ such that:~~;~~

i) light is emitted from the active region;

ii) light in the~~a~~ resonant optical mode propagates in the cavity in a direction tilted with respect to both a direction normal to a lateral plane and the lateral plane itself;

iii) the resonant optical mode has minimum optical losses compared with optical losses of the other optical modes; and

iv) a wavelength and a tilt angle of propagation of the light is stabilized.

2. (Original) The semiconductor laser of claim 1, further comprising a substrate below the bottom reflector.

3. (Currently Amended) The semiconductor laser of claim 2, wherein:

a) the active region emits light when exposed to an injection current when a forward bias is applied; and

b) the cavity ~~further~~ comprises:

i) a first confinement region below the active region;

ii) a second confinement region above the active region;

iii) a first n-doped current spreading region above the substrate and below the first confinement region;

iv) a first p-doped current spreading region above the second confinement region and below the top reflector;

v) a first current aperture placed between each neighboring region of the cavity; and

vi) a bias control device between the first n-doped current spreading region and the first p-doped current spreading region such that current can be injected into the active region to generate light.

4. (Original) The semiconductor laser of claim 1, wherein the active region is selected from the group consisting of:

a) at least one quantum well;

b) at least one sheet of quantum wires;

c) at least one sheet of quantum dots; and

d) any combination of a) through c).

5. (Currently Amended) The semiconductor laser of claim 4, <u>wherein the bottom reflector and the top reflector provide a first</u> ~~further comprising a feedback mechanism, wherein the~~ feedback mechanism in a vertical direction ~~is provided by the bottom reflector and the~~

~~top reflector~~, and the feedback mechanism in a lateral direction is provided by at least two side mirrors of the cavity.

6. (Original) The semiconductor laser of claim 1, wherein the bottom reflector and the top reflector are multilayered.

7. (Currently Amended) The semiconductor laser of claim 95, wherein:

a) the cavity ~~further~~ comprises at least one layer having a fifth refractive index, and at least one layer having a sixth refractive index, wherein:

i) the fifth refractive index is higher than the second refractive index; and

ii) the fifth refractive index is higher than the fourth refractive index;

iii) the sixth refractive index is lower than the first refractive index;

iv) the sixth refractive index is lower than the third refractive index;

v) the sixth refractive index is lower than the fifth refractive index;

vi) the sixth refractive index is higher than the second refractive index; and

vii) the sixth refractive index is higher than the fourth refractive index;

b) the bottom reflector comprises a topmost layer having the first refractive index; and

c) the top reflector comprises a bottommost layer having the third refractive index.

8. (Previously Presented) The semiconductor laser of claim 7, wherein the active region is located within the layer having the fifth refractive index.

9. (Previously Presented) The semiconductor laser of claim 7, wherein the active region is located within the layer having the sixth refractive index.

10. (Currently Amended) The semiconductor laser of claim 95, wherein:

a) the cavity ~~further~~ comprises at least one layer having a fifth refractive index and at least one layer having a sixth refractive index, wherein:

i) the fifth refractive index is lower than the first refractive index;

ii) the fifth refractive index is lower than the third refractive index;

iii) the sixth refractive index is lower than the first refractive index;

iv) the sixth refractive index is lower than the third refractive index;

v) the sixth refractive index is higher than the second refractive index;

vi) the sixth refractive index is higher than the fourth refractive index; and

vii) the sixth refractive index is higher than the fifth refractive index;

b) the bottom reflector comprises a topmost layer having the first refractive index; and

c) the top reflector comprises a bottommost layer having the third refractive index.

11. (Previously Presented) The semiconductor laser of claim 10, wherein the active region is located within the layer having the fifth refractive index.

12. (Previously Presented) The semiconductor laser of claim 10, wherein the active region is located within the layer having the sixth refractive index.

13. (Previously Presented) The semiconductor laser of claim 10, wherein the active region is located between the layer having the fifth refractive index and the layer having the sixth refractive index.

14. (Original) The semiconductor laser of claim 1, wherein the laser emits light in a vertical direction, such that the laser acts as a surface emitting laser.

15. (Cancelled)

16. (Previously Presented) The semiconductor laser of claim 1, further comprising an optical aperture, which allows the generated light to come out of the structure, wherein the optical aperture is made by partial selective removal of several layers of the top reflector.

17. (Previously Presented) The semiconductor laser of claim 1, further comprising an optical aperture, which allows the generated light to come out of the structure, wherein the optical aperture is made by an additional layer located on top of the top reflector.

18. (Original) The semiconductor laser of claim 1, wherein the laser emits light in a lateral direction, such that the laser acts as an edge-emitting laser.

19. (Original) The semiconductor laser of claim 1, wherein the feedback in the vertical direction is provided by multi-layered bottom and top reflectors.

20. (Original) The semiconductor laser of claim 1, wherein the top reflector comprises a single layer and the bottom reflector comprises multiple layers, such that the reflectors provide feedback in a vertical direction.

21. (Original) The semiconductor laser of claim 1, wherein the top reflector comprises multiple layers and the bottom reflector comprises a single layer, such that the reflectors provide feedback in a vertical direction.

22. (Original) The semiconductor laser of claim 1, wherein the top reflector and the bottom reflector each comprise a single layer, thus providing feedback in a vertical direction.

23. (Original) The semiconductor laser of claim 22, in which a tilted optical mode is tilted normal to the layers at an angle larger than the angle of a total internal reflection both at a boundary between the cavity and the top reflector, and a boundary between the cavity and the bottom reflector.

24. (Currently Amended) The semiconductor laser of claim 1, wherein the cavity ~~further~~ comprises at least one mirror on each side of the cavity which provide feedback in a lateral direction.

25. (Original) The semiconductor laser of claim 1, wherein the top reflector is partially etched to provide a distributed feedback in a lateral direction.

26. (Original) The semiconductor laser of claim 1, further comprising a grating fabricated above the top reflector, wherein the grating provides a distributed feedback in a lateral direction.

27. (Original) The semiconductor laser of claim 3, further comprising:

d) an absorbing element sitting on top of the top reflector, wherein the absorbing element includes an absorbing region which absorbs light transmitted through the top reflector.

28. (Original) The semiconductor laser of claim 3, further comprising:

d) an absorbing element sandwiched between the substrate and the bottom reflector, wherein the absorbing element includes an absorbing region which absorbs light transmitted through the bottom reflector.

29. (Previously Presented) The semiconductor laser of claim 3, further comprising:

d) a phase control element comprising:

i) a modulating region located above the first p-doped current spreading region, wherein the modulating region uses an electro-optical effect to modulate a wavelength of light;

ii) a second n-doped current spreading region above the modulating region;

iii) a second current aperture placed between each neighboring region of the phase control element; and

iv) a phase control element bias control device between the second n-doped current spreading region and the first p-doped current spreading region such that an electrical field can be created for the modulating region to modulate the wavelength of light.

30. (Original) The semiconductor laser of claim 29, wherein the modulating region modulates the wavelength of light when it is exposed to an electric field when a reverse bias is applied.

31. (Original) The semiconductor laser of claim 30, further comprising an optical aperture, which allows the generated light to come out of the structure.

32. (Original) The semiconductor laser of claim 31, in which the optical aperture is made by partial selective removal of several layers of the top reflector.

33. (Original) The semiconductor laser of claim 31, wherein the optical aperture is made by an additional layer located on top of the top reflector.

34. (Original) The semiconductor laser of claim 30, further comprising an absorbing element including an absorbing region placed on top of the top reflector to provide a light output in a lateral direction.

35. (Original) The semiconductor laser of claim 29, wherein the modulating region modulates the wavelength of light when it is exposed to an injection current when a forward bias is applied.

36. (Original) The semiconductor laser of claim 35, further comprising an optical aperture, which allows the generated light to come out of the structure.

37. (Original) The semiconductor laser of claim 36, wherein the optical aperture is made by partial selective removal of several layers of the top reflector.

38. (Original) The semiconductor laser of claim 36, wherein the optical aperture is made by an additional layer sitting on top of the top reflector.

39. (Original) The semiconductor laser of claim 36, further comprising an absorbing element including an absorbing region placed on top of the top reflector to provide a light output in a lateral direction.

40. (Previously Presented) The semiconductor laser of claim 29, further comprising:

e) a power modulating element including:

i) a first absorbing region located above the second n-doped current spreading region, wherein the first absorbing region uses an electro-optical effect to modulate an absorbed power;

ii) a second p-doped current spreading region above the first absorbing region;

iii) a third current aperture placed between each neighboring region of the power modulating element; and

iv) a power modulating element bias control device between the second n-doped current spreading region and the second p-doped current spreading region such that an electrical field can be created that causes the first absorbing region to shift a spectral position of an absorption peak thus modulating an absorption at a given wavelength of the emitted light.

41. (Original) The semiconductor laser of claim 40, wherein the first absorbing region is exposed to an electric field when a reverse bias is applied.

42. (Original) The semiconductor laser of claim 41, further comprising an optical aperture, which allows the generated light to come out of the structure.

43. (Original) The semiconductor laser of claim 41, further comprising an absorbing element including a second absorbing region located on top of the top reflector to provide a light output in a lateral direction.

44. (Original) The semiconductor laser of claim 40, wherein the first absorbing region is exposed to an injection current when a forward bias is applied.

45. (Original) The semiconductor laser of claim 44, further comprising an optical aperture which allows the generated light to come out of the structure.

46. (Original) The semiconductor laser of claim 44, further comprising an absorbing element including a second absorbing region located on top of the top reflector to provide a light output in a lateral direction.

47. (Previously Presented) The semiconductor laser of claim 3, further comprising

d) a power modulating element including:

i) a first absorbing region located above the first p-doped current spreading region, wherein the absorbing region uses an electro-optical effect to modulate an absorbed power;

ii) a second n-doped current spreading region above the absorbing region;

iii) a second current apertures placed between each neighboring region of the power modulating element; and

iv) a power modulating element bias control device between the second n-doped current spreading region and the first p-doped current spreading region such that an electrical field can be created that causes the absorbing region to shift a spectral position of an absorption peak thus modulating an absorption at a given wavelength of light.

48. (Original) The semiconductor laser of claim 47, wherein the first absorbing region modulates the absorbed power when it is exposed to an electric field when a reverse bias is applied.

49. (Original) The semiconductor laser of claim 48, further comprising an optical aperture, which allows the generated light to come out of the structure.

50. (Original) The semiconductor laser of claim 49, wherein the optical aperture is made by partial selective removal of several layers of the top reflector.

51. (Original) The semiconductor laser of claim 50, wherein the optical aperture is made by an additional layer located on top of the top reflector.

52. (Original) The semiconductor laser of claim 48, further comprising an absorbing element including a second absorbing region located on top of the top reflector to provide a light output in a lateral direction.

53. (Original) The semiconductor laser of claim 47, wherein the absorbing region is exposed to an injection current when a forward bias is applied.

54. (Original) The semiconductor laser of claim 53, further comprising an optical aperture, which allows the generated light to come out of the structure.

55. (Original) The semiconductor laser of claim 54, wherein the optical aperture is made by partial selective removal of several layers of the top reflector.

56. (Original) The semiconductor laser of claim 54, wherein the optical aperture is made by an additional layer located on top of the top reflector.

57. (Original) The semiconductor laser of claim 53, further comprising an absorbing element including a second absorbing region located on top of the top reflector to provide a light output in a lateral direction.

58. (Original) The semiconductor laser of claim 1, wherein one reflector is a multi-layered reflector, and the other reflector is a single-layered reflector.

59. (Original) The semiconductor laser of claim 58, wherein the bottom reflector is a single-layered reflector, and the top reflector is a multi-layered reflector.

60. (Original) The semiconductor laser of claim 59, wherein the tilted optical mode is tilted to the normal to the layers at an angle larger than the angle of the total internal reflection at a boundary between the cavity and the bottom reflector.

61. (Original) The semiconductor laser of claim 58, wherein the bottom reflector is a multi-layered reflector, and the top reflector is a single-layered reflector.

62. (Original) The semiconductor laser of claim 61, wherein the tilted optical mode is tilted to the normal to the layers at an angle larger than the angle of the total internal reflection at a boundary between the cavity and the top reflector.

63. (Original) The semiconductor laser of claim 3, wherein the active region is located at a local maximum of intensity of the resonant tilted optical mode.

64. (Original) The semiconductor laser of claim 29, wherein the modulating region is located at a local maximum of intensity of the resonant tilted optical mode.

65. (Original) The semiconductor laser of claim 29, wherein both the active region and the modulating region are located at local maxima of intensity of the resonant tilted optical mode.

66. (Original) The semiconductor laser of claim 47, wherein the absorbing region is placed at a local maximum of intensity of the resonant tilted optical mode.

67. (Original) The semiconductor laser of claim 47, wherein both the active region and the absorbing region are placed at local maxima of intensity of the resonant tilted optical mode.

68. (Original) The semiconductor laser of claim 40, wherein the active region, the modulating region, and the absorbing region are placed at local maxima of intensity of the resonant tilted optical mode.

69. (Previously Presented) The semiconductor laser of claim 3, wherein the cavity further comprises:

vii) a modulating region placed above the first p-doped current spreading region; and

viii) a second current aperture placed between the first p-doped current spreading region and the modulating region.

70. (Original) The semiconductor laser of claim 69, wherein the modulating region comprises a modulating layer exhibiting an absorption peak in a spectral region close to a spectral line of generated light.

71. (Original) The semiconductor laser of claim 70, wherein the modulating layer is designed such that a resonance decrease of its refractive index with an increase in temperature compensates an average non-resonant increase of an effective refractive index of the cavity thus providing an additional stabilization of a linewidth of emitted light against temperature variations.

72. (Original) The semiconductor laser of claim 71, wherein the modulating layer is placed at a local maximum of the resonant tilted optical mode.

73. (Original) The semiconductor laser of claim 71, wherein both the active region and the modulating layer are placed at local maxima of the resonant tilted optical mode.

74. (Cancelled)

75. (Cancelled)

76. (Cancelled)

77. (Cancelled)

78. (Cancelled)

79. (Cancelled)

80. (Cancelled)

81. (Cancelled)

82. (Cancelled)

83. (Cancelled)

84. (Cancelled)

85. (Original) The semiconductor laser of claim 1, wherein only a part of the laser structure is formed from a tilted cavity.

86. (Original) The semiconductor laser of claim 1, wherein at least one side surface of the tilted cavity is covered by a coating selected from the group consisting of a single-layer coating; and a multiple-layer coating;

wherein the coating controls a light output in the lateral direction.

87. (Original) The semiconductor laser of claim 1, wherein at least one optical fiber is attached in a near field zone of an electromagnetic field in a vicinity of a side surface of the cavity thus providing coupling of a resonant optical mode of the cavity to the optical fiber.

88. (Original) The semiconductor laser of claim 1, wherein at least one optical fiber is attached in a near field zone of an electromagnetic field in a vicinity of a top surface of the top reflector, thus providing coupling of a resonant optical mode of the cavity to the optical fiber.

89. (Original) The semiconductor laser of claim 1, wherein at least one optical fiber is attached in a near field zone of an electromagnetic field on top of a top surface of the top reflector, thus providing coupling of a resonant optical mode of the cavity to the optical fiber.

90. (Cancelled)

91. (Currently Amended) A semiconductor device comprising:

a) a bottom reflector;

b) a top reflector; ~~and~~

c) a cavity located between the bottom reflector and the top reflector; and~~comprising~~

d) an active region ~~located within the cavity~~ that can emit light;~~, wherein the cavity and the active region are designed such that~~

wherein the semiconductor device can be operated in at least one resonant optical mode, such that:

i) light is emitted from the active region;

ii) light in the~~a~~ resonant optical mode propagates in the cavity in a direction tilted with respect to both a direction normal to a lateral plane the lateral plane itself;

iii) the resonant optical mode has minimum optical losses compared with optical losses of the other optical modes; and

iv) a wavelength and a tilt angle of propagation of the light is stabilized.

92. (Previously Presented) The semiconductor device of claim 91, wherein the semiconductor device is selected from the group consisting of:

a) a semiconductor diode laser;

b) a photodetector; and

c) an optical amplifier.

93. (Previously Presented) The semiconductor laser of claim 6, wherein the bottom reflector comprises a periodic structure of layers, wherein the layers alternate between layers having a first refractive index and layers having a second refractive index, wherein the second refractive index is lower than the first refractive index.

94. (Previously Presented) The semiconductor laser of claim 6, wherein the top reflector comprises a periodic structure of layers, wherein the layers alternate between layers having a first refractive index and layers having a second refractive index, wherein the second refractive index is lower than the first refractive index.

95. (Previously Presented) The semiconductor laser of claim 93, wherein the top reflector comprises a periodic structure of layers, wherein the layers alternate between layers having a third refractive index and layers having a fourth refractive index, wherein the fourth-refractive index is lower than the third refractive index.

96. (New) The semiconductor device of claim 91, wherein at least one reflector selected from the group consisting of the bottom reflector and the top reflector is a multilayered reflector.

97. (New) The semiconductor laser of claim 1, wherein at least one reflector selected from the group consisting of the bottom reflector and the top reflector is a multilayered reflector.